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09/806,002	06/15/2001	Kristian Glejbol	U013327-7	1312

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EXAMINER	
MARKHAM, WESLEY D	
ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/806,002	GLEJBOL ET AL.	
	Examiner	Art Unit	
	Wesley D Markham	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Acknowledgement is made of the amendment filed by the applicant on 1/7/2005, in which the specification of the instant application, including the abstract, was amended, Claims 1 – 20 were canceled, and Claims 21 – 53 were added. **Claims 21 – 53** are currently pending in U.S. Application Serial No. 09/806,002, and an Office Action on the merits follows.

Priority

2. A copy of the certified copy of the priority document (i.e., Denmark PA 1998 01247, filed on 10/2/1998) has been received in this National Stage Application from the International Bureau pursuant to PCT Rule 17.2(a).

Oath/Declaration

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.The oath or declaration is defective because it does not properly identify the foreign application for patent or inventor's certificate on which priority is claimed pursuant to 37 CFR 1.55, and any foreign application having a filing date before that of the application on which priority is claimed, by correctly specifying the application number, country, day, month and year of its filing. Specifically, the declaration correctly identifies Denmark PA 1998

01247 but incorrectly specifies the filing date as October 4, 1998. Denmark PA 1998 01247 was filed on October 2, 1998, not October 4, 1998.

Specification

4. The objections to the specification (including the abstract of the disclosure), set forth in paragraphs 5 and 6 of the previous Office Action (i.e., the non-final Office Action, mailed on 10/31/2003), are withdrawn in light of the extensive amendments to the specification made by the applicant.

Claim Objections

5. Claims 25, 40, and 47 are objected to because of the following informalities:
   - Claim 25: The phrase, "wherein said monomers comprise vinylic com-pounds are selected from the group consisting of..." appears to contain typographical errors and should read, "wherein said monomers comprise vinylic compounds selected from the group consisting of..." in order to conform to proper English language grammar and syntax.
   - Claim 40: The phrase, "A method according to claims 39..." appears to contain a typographical error and should read, "A method according to claim 39..." (singular, not plural).
   - Claim 47: The phrase, "are carried out of a total pressure of between 0.2 and 100000 Pa" appears to contain a typographical error and should read, "are

carried out at a total pressure of between 0.2 and 100000 Pa" in order to conform to proper English language grammar and syntax.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 31 – 33 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. **Claim 31** (from which **Claims 32 – 33** depend) recites, in part, "A method according to claim 9..." However, Claim 9 has been canceled pursuant to the most recent amendment. Therefore, Claim 31 depends from a canceled claim, which renders the scope of Claim 31 vague and indefinite. For the purposes of examination only, the examiner has reasonably interpreted Claim 31 to depend from independent Claim 21.
9. **Claim 31** (from which **Claims 32 – 33** depend) recites the limitation "the monomer vapor" in line 1 of the claim. There is insufficient antecedent basis for this limitation in the claim. Specifically, independent Claim 21 (from which Claim 31 depends) recites monomer(s) in general, but not a monomer vapor. Therefore, it is unclear

what "the monomer vapor" in Claim 31 refers to, and the scope of the claims is vague and indefinite.

10. **Claim 42** recites that "step b) is started 10 to 30 seconds after step a)". This limitation renders Claim 42 vague and indefinite because it is unclear whether (1) step b) is started 10 to 30 seconds after step a) is started, or (2) step b) is started 10 to 30 seconds after step a) is completed. As such, the scope of Claim 42 is unclear.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the

various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claim 51 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yializis (USPN 6,214,422 B1).

15. Regarding **Claim 51**, Yializis teaches a metallized polymer substrate obtained by a method comprising the steps of subjecting the substrate surface to a gas plasma (Abstract, Col.2, lines 18 – 44, Col.4, lines 60 – 65, and Col.5, lines 3 – 5), forming a layer on the surface using a plasma enhanced polymerization process employing one or more monomers comprising monomers selected from the group of monomers listed by the applicant in step b) of the claim (Abstract, Col.2, lines 22 – 27, Col.4, lines 18 – 44 and 65 – 67, Col.5, lines 1 – 2 and 20 – 30, Col.6, lines 62 – 67, Col.7, lines 1 – 8 and 58 – 67, Col.8, and Col.10, lines 62 – 67), and providing a surface deposition using a PVD or CVD process to deposit metal atoms such as copper, tin, silver, palladium, platinum, or gold on the layer (Abstract, Col.2, lines 44 – 50, Col.5, lines 56 – 67, Col.6, lines 7 – 12, and Col.7, lines 9 – 19). As such, Yializis teaches a metallized polymer substrate having the following structure: a plasma-treated solid polymer substrate on which is sequentially deposited (1) a polymer layer (using

monomers from the group claimed by the applicant), and (2) a metal layer. This metallized polymer substrate is substantially identical to the metallized polymer substrate produced by the method of applicant's Claim 21 (i.e., because both metallized polymer substrates have the following structure: a plasma-treated solid polymer substrate on which is sequentially deposited (1) a polymer layer (using monomer(s) selected from the group claimed by the applicant), and (2) a metal layer). Therefore, Yializis anticipates product-by-process Claim 51. Please note that the patentability of a product does not depend on its method of production, and if the product of a product-by-process claim is the same as or obvious over a product of the prior art, the claim is unpatentable even though the prior art product was produced by a different process. Once the examiner provides a rationale tending to show that the claimed product is the same as or similar to the product of the prior art, the burden shifts to the applicant to come forward with evidence showing an unobvious difference between the products (see MPEP 2113).

16. Claims 21 – 23, 26, 27, 29, 30, 34 – 38, and 44 – 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1) in view of Glejbol et al. (WO 98/00457 A1).

17. Yializis teaches all the limitations of **Claims 21 – 23, 26, 27, 29, 30, 34 – 38, and 44 – 51** as set forth in paragraphs 18 – 19 and 29 of the previous Office Action (see the discussion of Claims 1 – 4, 6 – 8, 13, 14, 16, 18, 19, and 20), except for a method wherein the gas plasma pre-treatment of the polymer substrate is conducted at an

intensity level that ensures creation of radicals in the polymer surface without depolymerization of the solid polymer substrate. Specifically, Yializis teaches that the plasma pre-treatment of the polymer substrate can be carried out to functionalize the substrate, improve the cross-linking (bonding) of the substrate and the subsequently deposited polymer film, clean the substrate surface, etc. (Abstract, Col.2, lines 18 – 44, Col.4, lines 60 – 65, and Col.5, lines 3 – 5), but is silent regarding the specific plasma pre-treatment intensity level. Additionally, the conditions of the plasma pre-treatment of Yializis do not appear to be particularly limited (Col.5, lines 3 – 5). Glejbol et al. teaches that, in the art of plasma pre-treating the surface of a polymer substrate prior to depositing another polymeric layer thereon (i.e., a process analogous to that of Yializis), the plasma pre-treatment improves the surface affinity / bonding between the layers and should preferably be carried out at an intensity level that ensures creation of radicals in the polymer surface but does not depolymerize (i.e., damage) the substrate (page 1, lines 5 – 12, page 3, lines 18 – 21 and 33 – 36, pages 4 – 5, page 6, lines 1 – 5). Therefore, it would have been obvious to one of ordinary skill in the art to perform the plasma pre-treatment process of Yializis at an intensity level that ensures creation of radicals in the polymer surface but does not depolymerize the substrate (as taught by Glejbol et al.) with the reasonable expectation of successfully and advantageously improving the bonding between the substrate and the subsequently deposited polymer layer while insuring that the substrate is not damaged by depolymerization during the pre-treatment. Additionally and regarding Claim 23,

Yializis does not explicitly teach that the monomers comprise isocyanates selected from the group consisting of 1,4-diisocyanobutane and toluene 2,4-diisocyanate. However, the monomers used in the process of Yializis do not appear to be particularly limited and can comprise a wide variety of combinations (Abstract, Col.4, lines 18 – 25, Col.6, lines 62 – 67, Col.7, lines 1 – 8 and 58 – 67, Col.8, Col.9, lines 1 – 9). Glejbol et al. teaches that various combinations of acrylate monomers and other monomers, such as toluene 2,4-diisocyanate, can be utilized in a process analogous to that of Yializis in order to achieve the improved adhesion between the substrate and the overlying layer(s) (page 7, lines 1 – 9, page 14, lines 8 – 14). Therefore, it would have been obvious to one of ordinary skill in the art to utilize any number of well-known polymerizable monomers in the process of Yializis, including toluene 2,4-diisocyanate (as taught by Glejbol et al.), with the reasonable expectation of success and obtaining similar results (i.e., successfully producing a polymerized acrylate-based layer on the surface of a plasma pre-treated polymeric substrate, regardless of the specific combination of polymerizable monomers used to form the layer). Additionally and regarding Claim 36, Yializis does not explicitly teach that the polymer substrate is an injection molded polymer component, a polymer fiber, a polymer thread, or a polymer filler. Specifically, Yializis teaches that the substrate is a polymer film (Abstract) but is silent regarding the origin of the film. However, Glejbol et al. teaches that the plasma pre-treatment / polymer deposition process can successfully be performed on injection molded polymer substrates (page 5, lines 6 – 11). It would have been obvious to one of ordinary skill in the art to

perform the process of Yializis on a polymeric film produced by any well-known method, including injection molding, with the reasonable expectation of success and obtaining similar results (i.e., successfully producing a plasma treated / polymer coated / metallized polymer film substrate, regardless of how the polymer film is originally produced (e.g., injection molding, extrusion molding, compression molding, casting, etc.)). Additionally and regarding Claim 38, Yializis teaches that the gas plasma is generated in a LF or AF generated electric field of a plasma system (Col.5, lines 3 – 5), but does not explicitly teach that the plasma system comprises an electrode arrangement having electrodes arranged so that every third electrode is connected to different voltages. However, the plasma treatment method and apparatus used in the process of Yializis does not appear to be particularly limited (Col.5, lines 3 – 5). Glejbol et al. teaches that a plasma system comprising an electrode arrangement having electrodes arranged so that every third electrode is connected to different voltages is preferred in the context of generating a plasma used to pre-treat the surface of a polymer substrate (pages 6 and 11). As such, it would have been obvious to one of ordinary skill in the art to utilize a plasma system having the electrode arrangement of Glejbol et al. to conduct the plasma treatment of Yializis with the reasonable expectation of (1) success, as the plasma treatment method and apparatus used in the process of Yializis is not particularly limited, and (2) achieving the objective of Yializis (i.e., plasma pre-treating the surface of a polymer substrate) by using a preferred method designed to achieve the aforementioned objective.

18. Claims 24, 25, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1) in view of Glejbol et al. (WO 98/00457 A1), in further view of Horowitz et al. (USPN 3,998,602).

19. The combination of Yializis and Glejbol et al. teaches all the limitations of **Claims 24, 25, and 28** as set forth above in paragraph 17, except for a method wherein the monomers comprise allylic compounds selected from the group recited by the applicant, vinylic compounds selected from the group recited by the applicant, and/or glycidal methacrylate. However, the monomers used in the process of Yializis do not appear to be particularly limited and can comprise a wide variety of combinations comprising acrylates (Abstract, Col.4, lines 18 – 25, Col.6, lines 62 – 67, Col.7, lines 1 – 8 and 58 – 67, Col.8, Col.9, lines 1 – 9). Glejbol et al. teaches that various combinations of acrylate monomers, including glycidal methacrylate, and/or other monomers, such as allylic monomers and vinylic monomers, can be utilized in a process analogous to that of Yializis in order to achieve the improved adhesion between the substrate and the overlying layer(s) (page 7, lines 1 – 9, Claim 3). Horowitz et al. teaches the functional equivalence of (1) monomers (and various mixtures / combinations thereof) such as allylic compounds selected from the group recited by the applicant, vinylic compounds selected from the group recited by the applicant, and/or glycidal methacrylate, and (2) acrylate monomers such as those taught by Yializis in the context of a polymerized layer deposited on a polymeric substrate prior to metallization (Abstract, Col.5, lines 8 – 34, and Claim 9).

Therefore, it would have been obvious to one of ordinary skill in the art to utilize the monomers claimed by the applicant (and taught by Horowitz et al.) in the process of the combination of Yializis and Glejbol et al. with the reasonable expectation of success and obtaining similar results (i.e., successfully producing a polymerized layer on the surface of a plasma pre-treated polymeric substrate prior to metallization, regardless of the specific polymerizable monomers, or combination thereof, used to form the layer).

20. Claims 31 – 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1) in view of Glejbol et al. (WO 98/00457 A1), in further view of either Wenz et al. (USPN 5,312,864) or Hechenberger et al. (USPN 4,997,861).

21. The combination of Yializis and Glejbol et al. teaches all the limitations of **Claims 31 – 33** as set forth above in paragraph 17, except for a method wherein the monomer prior to vaporization consists essentially of (1) 2-ethylcyanoacrylate, (2) an acid having a partial vapor pressure in the plasma which is lower than (half) the partial vapor pressure of 2-ethylcyanoacrylate, and (3) up to 40 weight percent of another filler, wherein the acid is a polyphosphoric acid and is present prior to vaporization in a concentration up to 10 weight %. However, the monomer of Yializis is, prior to vaporization, in liquid form (Col.5, lines 20 – 30) and can be 2-ethylcyanoacrylate (Col.7, line 3, and Col.8, lines 18 – 19). Additionally, Glejbol et al. teaches that a monomer prior to vaporization consisting essentially of (1) 2-ethylcyanoacrylate, (2)

an acid having a partial vapor pressure in the plasma which is lower than (half) the partial vapor pressure of 2-ethylcyanoacrylate, and (3) up to 40 weight percent of another filler, wherein the acid is a polyphosphoric acid and is present prior to vaporization in a concentration up to 10 weight % (as claimed by the applicant) is particularly preferred (page 7). Wenz et al. teaches that it was known in the art at the time of the applicant's invention to include a polymerization inhibitor such as a sulfonic acid or a phosphoric acid in a 2-ethylcyanoacrylate composition in order to stabilize it in storage (Col.5, lines 8 – 20, and Col.7, lines 64 – 65). The amount of stabilizer added is from 1 to 1,000 ppm, based on the total weight of the composition (Col.5, line 17). Hechenberger et al. teaches that it was known in the art at the time of the applicant's invention to include an acidic stabilizer such as phosphoric acid in a cyanoacrylate composition in order to stabilize against polymerization of the cyanoacrylate (Col.1, lines 7 – 10, and Col.2, lines 44 – 58). The amount of stabilizer added is from 100 to 500 ppm (Col.2, lines 40 – 43). Therefore, it would have been obvious to one of ordinary skill in the art to add a small amount (e.g., 1 to 1,000 ppm or 100 to 500 ppm) of acidic stabilizer such as a (poly)phosphoric acid to the 2-ethylcyanoacrylate monomer liquid of Yializis prior to vaporization with the reasonable expectation of successfully and advantageously stabilizing the composition against polymerization during storage. By utilizing such a small amount of acidic stabilizer, as taught by either Wenz et al. or Hechenberger et al., the acid would necessarily have a partial vapor pressure (i.e., concentration) in the plasma which is lower than half of the partial vapor pressure of 2-ethylcyanoacrylate.

22. Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1) in view of Glejbol et al. (WO 98/00457 A1), in further view of Yializis et al. (USPN 4,842,893).

23. The combination of Yializis and Glejbol et al. teaches all the limitations of **Claims 39 – 40** as set forth above in paragraph 17, except for a method wherein the monomer pressure in step b) is between 0.1 and 100,000 Pa (Claim 39), particularly between 10 and 1,000 Pa (Claim 40). Specifically, Yializis is silent as to the monomer pressure. However, Yializis does point to USPN 4,842,893 (i.e., Yializis et al.) as teaching the basic aspects of the vacuum polymerization process (Col.4, lines 26 – 30). Yializis et al. teaches that, in the vacuum polymerization process analogous to that taught by Yializis, the acrylate monomers should have a high vapor pressure of up to 0.1 Torr (i.e., 13.3 Pa) (Col.2, lines 41 – 52). This monomer pressure is within the applicant's claimed pressure range. It would have been obvious to one of ordinary skill in the art to utilize a monomer pressure in the range claimed by the applicant (and taught by Yializis et al.) in the polymerization process step of Yializis because Yializis is silent as to the monomer pressure and points to USPN 4,842,893 (i.e., Yializis et al.) as teaching the basic aspects of the vacuum polymerization process, and Yializis et al. teaches that monomer pressures in the range claimed by the applicant are operable.

24. Claims 41 – 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1) in view of Glejbol et al. (WO 98/00457 A1), in further view of Yializis et al. (USPN 4,842,893), and either Polak (USPN 4,382,101) or Hodgkin et al. (WO 97/31034 A1).

25. The combination of Yializis, Glejbol et al., and Yializis et al. teaches all the limitations of **Claims 41 – 43** as set forth above in paragraph 23, except for a method wherein the generation step a) (i.e., the plasma treatment step) is carried out for a period of between 0.01 and 1,000 seconds, and the step b) (i.e., the plasma polymerization / monomer deposition step) is carried out for a period of between 0.1 and 1,000 seconds (Claim 41), particularly wherein step a) is carried out for more than 30 seconds, and step b) is started 10 to 30 seconds after step a) (Claim 42), particularly wherein step a) is carried out for a period of between 10 and 60 seconds and step b) is carried out for a period of between 10 and 200 seconds (Claim 43). Specifically, Yializis is silent as to the duration of steps a) and b), as well as the time between steps a) and b). However, Yializis does point to USPN 4,842,893 (i.e., Yializis et al.) as teaching the basic aspects of the vacuum polymerization process (Col.4, lines 26 – 30) and state that the thickness of the polymer film (i.e., the film deposited by the plasma polymerization process) depends on the particular application (Col.6, lines 34 – 38). Yializis et al. teaches that, in a vacuum polymerization process analogous to that taught by Yializis, the thickness of the coating is dependent upon the time of deposit (Col.6, lines 39 – 40). In other words, Yializis et al. teaches that the deposition time is a result / effective variable that

determines the thickness of the film. It would have been obvious to one of ordinary skill in the art to optimize the polymer deposition time (i.e., step b)) in the process of Yializis as a result / effective variable through routine experimentation, including to a value in the range claimed by the applicant, in order to achieve the specific film thickness desired by the purveyor in the art. The exact deposition time would depend on the exact film thickness desired. Additionally, Polak teaches that plasma pretreatment times of from about 0.1 minute to about 4 hours are utilized to pretreat a polymeric substrate prior to the deposition of a subsequent layer in order to increase the peel-strength between the layers (Col.1, lines 60 – 68, and Col.2, lines 1 – 6). The exact treatment time depends on the operating conditions, such as temperature, pressure, power, etc. and should be sufficient to treat the surface of the polymer until the surface is more susceptible to bonding with the subsequently deposited layer (Col.3, lines 11 – 19). Hodgkin et al. teaches that a plasma pretreatment time of about 60 seconds is sufficient to clean the surface of a polymeric material prior to depositing a polymeric coating by plasma polymerization thereon (page 1, lines 30 – 32, page 2, lines 1 – 2 and 13 – 20, and page 5, line 11). It would have been obvious to one of ordinary skill in the art to utilize a plasma pretreatment time (i.e., step a)) in the range claimed by the applicant (and taught by Polak and Hodgkin et al.) with the reasonable expectation of successfully and advantageously preparing the polymeric substrate surface of Yializis for subsequent deposition steps by using a plasma pretreatment process for a period of time known in the art to be sufficient to prepare (i.e., clean and improve the adhesion of) the

aforementioned substrate. The exact plasma treatment time would depend on the operating conditions, such as temperature, pressure, power, etc., and would be determined by one of ordinary skill in the art. Regarding the limitation in Claim 42 that step b) is started 10 to 30 seconds after step a), the combination of Yializis, Yializis et al., and either Polak or Hodgkin et al. does not explicitly teach this limitation. However, in the process of Yializis, the period of time between step a) (i.e., the plasma treatment step) and step b) (i.e., the forming a layer / plasma polymerization step) would be determined by the drum rotation speed (i.e., the faster the drum rotates, the shorter the period of time between steps a) and b)). Yializis teaches a wide range of drum rotation speeds (Col.5, lines 10 – 11), and the drum rotation speed would also be expected to determine the length of time spent at each process station and thus the thickness of the layer deposited at each station. Since it would have been obvious to one of ordinary skill in the art to optimize the length of time spent at each station in the process of Yializis (see the discussion in this paragraph above), it would also have been obvious to one of ordinary skill in the art to optimize the drum speed (and therefore the period of time between steps a) and b)) through routine experimentation in order to achieve the desired plasma treatment time and coating layer thickness values.

26. Claims 21 – 23, 27 – 33, and 36 – 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokura et al. (JP 01-171856 A) in view of Glejbol et al. (WO 98/00457 A1).

27. Regarding independent **Claim 21** (and product-by-process **Claim 51**), Yokura et al. teaches a method of metallizing a solid polymer substrate (e.g., a film), the method comprising (1) forming a layer on the substrate surface by a plasma enhanced polymerization process using one or more monomers selected from the group recited by the applicant (e.g., glycidal methacrylate), and (2) providing a surface deposition using vapor deposition (i.e., PVD or CVD) to form a deposit of metal atoms on the layer (Abstract). Yokura et al. does not explicitly teach generating radicals on the substrate surface by subjecting the surface to a gas plasma at an intensity level that ensures creation of radicals in the polymer surface without depolymerization of the polymer substrate. However, the overall process of Yokura et al. is intended to produce a plasma polymerized layer on the surface of a polymeric substrate in order to insure a high bonding strength between the layers (e.g., between the substrate and the subsequently deposited metallic layer) (Abstract). Glejbol et al. teaches that, in the art of depositing a plasma polymerized layer from a monomer such as glycidal methacrylate on a polymeric substrate (i.e., a process analogous to that of Yokura et al.), a radical-generating plasma pre-treatment improves the surface affinity / bonding between the layers and should preferably be carried out at an intensity level that ensures creation of radicals in the polymer surface but does not depolymerize (i.e., damage) the substrate (page 1, lines 5 – 12, page 3, lines 18 – 21 and 33 – 36, pages 4 – 5, page 6, lines 1 – 5). Therefore, it would have been obvious to one of ordinary skill in the art to use the plasma pre-treatment and polymerization process and apparatus of Glejbol et al. in

conjunction with the glycidal (meth)acrylate plasma polymerization process (as taught by both Yokura et al. and Glejbol et al.) / metallic film vapor deposition process of Yokura et al., the plasma pre-pretreatment being performed at an intensity level that ensures creation of radicals in the polymer surface but does not depolymerize the substrate (as taught by Glejbol et al.), with the reasonable expectation of successfully and advantageously improving the bonding between the substrate and the subsequently deposited layers while insuring that the substrate is not damaged by depolymerization during the pre-treatment. The combination of Yokura et al. and Glejbol et al. also teaches the following claim limitations: (1) The monomer(s) comprise glycidal methacrylate, toluene 2,4-diisocyanate, or combinations thereof (**Claims 22, 23, 27 and 28**) (Abstract of Yokura et al.; page 7, lines 1 – 9, page 14, lines 8 – 14, and Claims 2 – 3 of Glejbol et al.); (2) the monomer vapor comprises / consists essentially of the components recited by the applicant in **Claims 29 – 33** (page 7 of Glejbol et al.); (3) the specifics of the plasma generation / plasma system recited by the applicant in **Claims 37 – 38** (page 5, line 25 – page 6, line 28; page 11, lines 3 – 31 of Glejbol et al.); (4) the specific monomer pressure, total pressure, time period(s), temperature, and relative order (i.e., starting and stopping order and times) of steps a), b), c), and d) recited by the applicant in **Claims 39 – 50** (pages 8 – 9, Claims 11 – 15 of Glejbol et al.); and (5) the plasma enhanced polymerization process comprises / consists essentially of adding a vapor comprising the monomers to the gas plasma (**Claims 52 and 53**) (page 8, lines 9 – 34, page 12, lines 14 – 18, page 13, lines 18 – 24 of Glejbol et al.). Regarding **Claim**

36, Yokura et al. does not explicitly teach that the polymer substrate is an injection molded polymer component, a polymer fiber, a polymer thread, or a polymer filler. Specifically, Yokura et al. teaches that the substrate is a polymer film (Abstract) but is silent regarding the origin of the film. However, Glejbol et al. teaches that the plasma pre-treatment / polymer deposition process can successfully be performed on injection molded polymer substrates (page 5, lines 6 – 11). It would have been obvious to one of ordinary skill in the art to perform the process of the combination of Yokura et al. and Glejbol et al. on a polymeric film produced by any well-known method, including injection molding, with the reasonable expectation of success and obtaining similar results (i.e., successfully producing a polymer coated / metallized polymer film substrate, regardless of how the polymer film is originally produced (e.g., injection molding, extrusion molding, compression molding, casting, etc.)).

Response to Arguments

28. Applicant's arguments filed on 1/7/2005 have been fully considered but they are not persuasive. Specifically, the majority of the applicant's arguments are moot in view of the new grounds of rejection presented above.

29. The applicant does argue that Yializis teaches radiation curing a flash evaporated monomer, not plasma polymerization of a monomer (as required by independent Claim 21). In other words, the applicant argues that Yializis teaches plasma treatment before and after formation of the acrylate coating, but does not teach formation of the coating using plasma treatment. In response this argument is not

convincing. Specifically, the claim language at issue recites, "forming a layer on the substrate surface by a plasma enhanced polymerization process using one or more monomers selected from the group consisting of...(monomers recited in the claim)". Yializis teaches evaporating and condensing one or more monomers selected from the group recited by the applicant (e.g., various acrylate monomers) on the plasma treated substrate surface, and plasma treating the coating to complete the polymerization process. As such, the "layer" of Yializis is formed by a plasma enhanced polymerization process (i.e., the plasma treatment used to complete the curing process) using one or more monomers selected from the group recited by the applicant, as required by Claim 21. Nothing in Claim 21 precludes the "plasma enhanced polymerization" from occurring after the monomer(s) is/are deposited on the polymeric film surface and partially cured, as the applicant appears to imply. In the same vein and in response to applicant's argument that the reference fails to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the use of a gas plasma for polymerizing the monomer, wherein a gas of monomer is excited by the gas plasma, i.e., a state of wholly or partially ionized gas comprising neutral gas molecules, gas fragment, free electrons, cations, and excited molecules – see the sentence bridging pages 24 and 25 of the 1/7/2005 response) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ueno et al. (USPN 4,603,057) teaches a method comprising plasma polymerizing a vapor of an organosilicon compound on the surface of a resin substrate prior to metallizing the substrate in a dry process such as vacuum vapor deposition, etc.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (571)

272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wesley D Markham
Examiner
Art Unit 1762

WDM

TIMOTHY MEEKS
PRIMARY EXAMINER